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| EXAMINER |
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NATNAEL, PAULOS M

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| ART UNIT | PAPER NUMBER |
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2622

DATE MAILED: 03/22/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/923,920

Applicant(s)

MCDONALD, DAVID C.

Examiner

Paulos M. Natnael

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 December 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☒ Claim(s) 7-17 and 20 is/are allowed.
- 6) ☒ Claim(s) 1,4-6 and 21 is/are rejected.
- 7) ☒ Claim(s) 2,3,18 and 19 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 10/28/04, 5/23/05.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 103

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims **1,4-6, 21** are rejected under 35 U.S.C. 103(a) as being unpatentable over Pettit, U.S. 6,256,073.

Considering claim **1**, Pettitt discloses all claimed subject matter, note;

a) a segmented color wheel having four segments...,is met by color wheel 400, fig.4;

b) the claimed three of the segments being primarily transmissive in only a portion of the wavelength spectrum of visible light, the portion for each of the three segments not being identical, is met by segments 402-408 which are not identical.

c) a fourth segment... is met by the white segment;

d) a base to which the color wheel is rotatably mounted, is inherent because the color wheel 400 is rotating color wheel and has to be mounted somewhere.

As to the fourth segment...being broadly transmissive across the wavelength spectrum of visible light, the broadly-transmissive segment having a transmittance that

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is not uniform across the wavelength spectrum of visible light so as to provide a desired color of light transmitted therethrough, Pettitt discloses a white segment as the fourth segment. It is well known that while the three filters/segments are designed to pass or transmit specific amount of light, the fourth segment (which is used for controlling brightness of the displayed color) is designed to pass all visible light. In that regard, Pettit discloses: "[a]lternatively, a fourth segment is used to transmit white light. The white light is used to increase image brightness." Col. 4, lines 15-17. The fourth segment is passing light of all colors or luminance light. In other words, while the primary color filters/segments filter out all other light except the red, the green or the blue light, the fourth segment transmits/passes certain amounts of light of all colors. Since the amount is claimed to be merely "non-uniform", without giving a specific amount or value, the disclosure of Pettitt is impliedly discloses the claimed subject matter. Thus, it would have been therefore obvious to the skilled in the art at the time the invention was made to implement the system of Pettitt because the claimed fourth segment being transmissive of non-uniform amounts of red, green, and blue light as in claims 1 and 21 is impliedly met by the disclosure of Pettitt as shown above.

Considering claim 4, a color sequencing system as defined in claim 1, wherein the spectral transmittance of the broadly-transmissive segment is attenuated in some portion of the wavelength spectrum of visible light;

See rejection of claim 1(c).

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Considering claim 5, a color sequencing system as defined in claim 1, wherein the spectral transmittance of the broadly-transmissive segment is notched in some portion of the wavelength spectrum of visible light.

See rejection of claim 1.

Considering claim 6, a color sequencing system as defined in claim 1, wherein the three segments transmit light that is primarily red, green, and blue, respectively, is met by the four segments which transmit light that is red, green (shortwave and longwave) and blue. (see Table 1)

Regarding claim 21, see rejection of claim 1;

Response to Arguments

3. Applicant argues:

“Claim 1, on the other hand, defines a color sequencing system with a color wheel having four segments, with a fourth segment being broadly transmissive across the wavelength spectrum of visible light while the broadly-transmissive segment has a transmittance at some wavelengths of visible light that is different from a transmittance at some other wavelengths of visible light...

Pettitt's only disclosure of a segment that is broadly transmissive across the visible light spectrum is when he briefly mentions at col. 5, lines 15-17 that

"[a]lternatively, a fourth segment is used to transmit white light. The white light is used to increase image brightness." There is no other detailed discussion of the characteristics of such a segment. There is certainly no teaching or suggestion in Pettitt of the fourth segment having a transmittance that is different at some wavelengths of visible light than at some other wavelengths of visible light. This is because Pettitt is attempting to minimize variances from assembled unit to another assembled unit, while the present invention is directed to improve efficiency and provide a desired color of light transmitted through the fourth segment of the color wheel. Purely by way of 'example, consider a color wheel that is used with a light source such as an arc lamp. Arc lamps may have an emittance characteristic with a strong peak in the yellow region. A color wheel could be employed with a fourth segment that is broadly transmissive and has a notch in the yellow region; e.g. the transmittance of the segment may be nearly unity at all wavelengths except for a narrow band of wavelengths in the yellow portion of the spectrum where the segment transmittance is rather lower than unity. This would meet the claim 1 limitation of having a transmittance at some wavelengths that is different than at other wavelengths. The segment of this example would not be white as taught by Pettitt, but would appear bluish when viewed with light from a natural spectrum such as sunlight. The light from an arc lamp having an emittance peak in the yellow that passes through this exemplary fourth segment would, however, have a smoother or more uniform intensity across the wavelength spectrum, since the transmittance notch in the

fourth segment compensates for the peak in the emittance characteristics of the arc lamp.”

Applicants admit that Pettitt et al. on col. 5, lines 15-17 disclose “a segment that is broadly transmissive across the visible light spectrum...” The applicants nevertheless fault Pettitt for failing to further provide “detailed discussion of the characteristics of a segment.” Pettitt did not do so because it was notoriously well known in the art and no further description was necessary. Pettitt clearly states the fourth segment is used to transmit white light, i.e., the fourth segment is passing amounts of light of all colors or luminance light and it is utilized to increase image brightness, as is well known in the art. (See for example Yamanak et al., the cited reference below). In other words, while the primary color filters/segments filter out all other light except the red, the green or the blue light, the fourth segment transmits certain amounts of light of all colors. Since the amount in the instant application is claimed to be merely “non-uniform” without giving a specific amount or value, the disclosure of Pettitt is considered adequate in this regard. Therefore, the claimed the fourth segment being transmissive of non-uniform amounts of red, green, and blue light as in claims 1 and 21 is met by the disclosure of Pettitt as described above.

Allowable Subject Matter

4. Claims **7-17** and **20** are allowable over the cited prior art.

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5. Claims **2,3,18,19** are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Yamanaka et al., U.S. 4,200,883 discloses a solid state color television camera comprising the primary color filters as well as a fourth filter segment passing light of all colors.

7. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire **THREE MONTHS** from the mailing date of this action. In the event a first reply is filed within **TWO MONTHS** of the mailing date of this final action and the advisory action is not mailed until after the end of the **THREE-MONTH** shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than **SIX MONTHS** from the mailing date of this final action.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Paulos M. Natnael whose telephone number is (571) 272-7354. The examiner can normally be reached on 9am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Ometz can be reached on (571)272-7593. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Paulos M. Natnael
Primary Examiner
Art Unit 2614

March 19, 2006